

## **ABSTRACT**

A valve actuation system and method for use in an internal combustion engine including at least one combustion cylinder having a piston and an engine valve. The valve actuation system includes a hydraulic pump, a high-pressure reservoir, and an electro-hydraulic valve actuator. The hydraulic pump is configured to produce a hydraulic output based on a valve-piston clearance profile of at least one cylinder of the combustion engine. The high-pressure reservoir is coupled with the hydraulic pump. The electro-hydraulic valve actuator is coupled with the high-pressure reservoir via a first control valve and configured to actuate at least one engine valve of the combustion engine according to an output of the hydraulic pump.